Space Weather Forecast

Issued on Tuesday, 22 February 2022 at 13:07 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance throughout of Moderate flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with one common class flare observed. There are three regions on the visible disk, the oldest is near the centre disc and is weak and stable. The two new regions to the northeast both appear unipolar at the moment and are yet to come fully into view, and will require further analysis as they do. The more southerly region is thought to be the source of a notable far-sided flare and Coronal Mass Ejection (CME) on the 15th Feb, as well as the common class flare described above. No Earth-directed CMEs were observed in the available imagery during the past 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind has indicated that Earth has been experiencing the fast winds from a positive coronal hole. The wind speed has been slightly elevated or elevated, mainly between 495 and 590 km/s. The total magnetic field strength, has been weak, with no significant deflections in its north-south component. Resultant geomagnetic activity was Quiet to Unsettled (Kp 1-3) with Active (Kp4) intervals between 21/1200-1500 UTC and 22/0300-0900 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has remained very slightly above background levels, but is gradually declining and is well below the threshold for solar radiation storms. This was due to the large far sided flare and CME on the 15th.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Low, but there is a slight chance of rising to Moderate levels through the 4 days due to the potential for flaring from the two regions emerging from the northeast limb. The other sunspot regions on the Earth-facing disc are currently unlikely to produce significant flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs in the forecast. Earth is experiencing a fast wind from a coronal hole, with this expected to persist during days 1 and 2 (22 and 23 Feb), before gradually easing. Geomagnetic activity is expected to start Quiet to Unsettled, with a chance of Active intervals and slight chance of a G1/Minor Storm days 1 and 2 (22 and 23 Feb). However, this risk will reduce through the forecast period and activity is expected to become predominantly Quiet for days 3 and 4 (24 and 25 Feb).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to soon fall to background, with no solar radiation storms expected through the period.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	2	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	15	20	20	20
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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